

46. (New Claim) The embedded electroconductive layer according to claim 3 wherein said electroconductive layer is a Cu layer.

47. (New Claim) The embedded electroconductive layer according to claim 5, wherein said electroconductive layer is a Cu layer.

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cont'd.
48. (New Claim) The embedded electroconductive layer according to claim 1, wherein said metal growth promoting layer is a TiN layer including substantially no oxygen except at its surface due to said TiN layer being formed by a chemical vapor deposition (CVD) process.

49. (New Claim) The embedded electroconductive layer according to claim 3, wherein said metal growth promoting layer is a TiN layer including substantially no oxygen except at its surface due to said TiN layer being formed by a chemical vapor deposition (CVD) process.

REMARKS

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached Appendix is captioned "**Version with markings to show changes made.**"

As a preliminary matter, Applicant notes that the Examiner failed to indicate that dependent Claim 37 is still pending in this application. Since this claim has not been cancelled, Applicant submits that it is still pending, and an indication of such is respectfully requested.

Claims 1, 3-7 and 44 stand rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent No. 5,070,036 to Stevens. Applicant respectfully traverses this rejection.

Applicant respectfully submits that the cited reference fails to disclose all of the features of the present invention. Specifically, the Stevens reference fails to disclose the claimed invention as defined in independent Claims 1 and 3, which includes, *inter alia*, a barrier layer, a metal growth promoting layer, and an electroconductive layer, where the electroconductive layer is “formed directly on said metal growth promoting layer.” Nor does the Stevens reference disclose the claimed invention as defined in independent Claim 5, which includes, *inter alia*, a ground layer and an electroconductive layer, where the electroconductive layer is “formed directly on said upper part of said ground layer.”

With regard to independent Claims 1 and 3, one example of an embodiment defined by these claims is shown in Figure 1, which includes barrier layer 4, metal growth promoting layer 5 and an embedded electroconductive layer 6 that is formed “directly” on the metal growth promoting layer 5. Thereby, growth of the electroconductive layer is promoted

In contrast, in Figure 1 of Stevens, layer 9, which is the layer that most closely resembles the claimed electroconductive layer, is not formed directly on layer 7, which is the

layer that the Examiner has equated with the claimed growth promoting layer. Instead, layer 8, which comprises silicon dissolved to the saturation concentration in an aluminum titanium compound (col. 8, lines 8-9), is located between layers 7 and 9. Accordingly, layer 9 is not “formed directly” on layer 7.

Layer 8 of Stevens serves as a barrier to impede unwanted reactions between layers 7 and 9. Thus, growth of the aluminum alloy layer 9 is not promoted. Moreover, since layer 8 of Stevens is essential for its barrier properties, it would not have been obvious to omit this layer.

Since all of the features defined in independent Claims 1 and 3 are not disclosed in the Stevens reference, Applicant respectfully requests the withdrawal of this §102 rejection of independent Claims 1 and 3.

Claims 4 and 44 depend from either independent Claim 1 or from independent Claim 3, and therefore include all of the features of either Claim 1 or Claim 3, plus additional features. Accordingly, Applicant respectfully requests that the § 102 rejection of dependent Claims 4 and 44 under Stevens be withdrawn considering the above remarks directed to independent Claims 1 and 3.

With regard to independent Claim 5, Applicant respectfully submits that the Stevens reference fails to disclose the claimed invention that includes, *inter alia*, an electroconductive layer and a ground layer, where the electroconductive layer is “formed directly on said upper part of said ground layer.” One example of an embodiment defined by this claim is shown in Figure 12D, which shows ground layer 20e (including low oxygen

upper part 17b and higher oxygen lower part 17a) and electroconductive layer 16. As can be seen in Figure 12D, the electroconductive layer 16 is “formed directly” on the upper part 17b of the ground layer 20e. In contrast, in the device of Stevens, as mentioned above, there is an intervening layer (layer 8) between layers 7 and 9 (see Figure 1 of Stevens). Accordingly, as all of the features of Claim 5 are not disclosed in Stevens, Applicants respectfully request that this §102 rejection of Claim 5 under Stevens be withdrawn.

Claims 6 and 7 both depend from independent Claim 5, and therefore include all of the features of Claim 5, plus additional features. Accordingly, Applicant respectfully requests that the §102 rejection of dependent Claims 6 and 7 under Stevens be withdrawn considering the above remarks directed to independent Claim 5.

Claims 2, 40 and 41 stand rejected under 35 U.S.C. §103 as being unpatentable over Stevens in view of United States Patent No. 4,910,169 to Hoshino. Claim 42 stands rejected under 35 U.S.C. §103 as being unpatentable over Stevens in view of United States Patent No. 5,552,341 to Lee. Claim 43 stands rejected under 35 U.S.C. § 103 as being unpatentable over Stevens in view of United States Patent No. 5,612,254 to Mu et al. Applicant respectfully traverses these §103 rejections.

Claims 2 and 40-43 all depend from either independent Claim 1 or from independent Claim 3, and therefore include all of the features of either Claim 1 or Claim 3, plus additional features. Accordingly, Applicant respectfully requests that the §103 rejections of dependent Claims 2 and 40-43 be withdrawn considering the above remarks directed to independent Claims 1 and 3, and also because neither Hoshino, Lee or Mu et al.

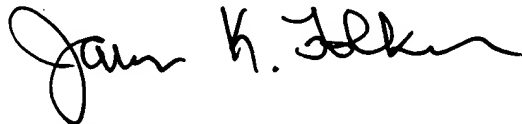
remedy the deficiencies in the Stevens device discussed above, nor were these references relied upon for the features discussed above.

In addition, Applicants have also added new dependent Claims 45-49. Applicant respectfully submits that new Claims 45-49 are also allowable over the cited references.

For all of the above reasons, Applicant requests reconsideration and allowance of the claimed invention. Should the Examiner be of the opinion that a telephone conference would aid in the prosecution of the application, or that outstanding issues exist, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE****In the Claims:**

Please amend Claims 1, 3 and 5 and add new Claims 45-49 as follows:

1. (Amended Four Times) An embedded electroconductive layer comprising:

any one of an opening part or a depressed part formed in an insulating film on a substrate;

a barrier layer covering said opening part or said depressed part, said barrier layer being made of a first material;

a metal growth promoting layer formed directly on said barrier layer, said metal growth promoting layer being made of a second material that is different from said first material of said barrier layer; and

an electroconductive layer embedded in said opening part or said depressed part via said barrier layer and said metal growth promoting layer, said electroconductive layer being formed directly on said metal growth promoting layer.

3. (Amended Four Times) An embedded electroconductive layer comprising:

any one of an opening part or a depressed part formed in an insulating film on a substrate;

a barrier layer covering said opening part or said depressed part;

a metal growth promoting layer formed directly on said barrier layer, said metal growth promoting layer being made of a material different from that of said barrier layer; and

an electroconductive layer embedded in said opening part or said depressed part via said barrier layer and said metal growth promoting layer; said electroconductive layer being formed directly on said growth promoting layer;

wherein said metal growth promoting layer is a TiN layer containing oxygen at a lower concentration than said barrier layer.

5. (Three Times Amended) An embedded electroconductive layer comprising:

any one of an opening part or a depressed part formed in an insulating layer on a substrate;

a ground layer containing oxygen at a high concentration in the lower part thereof and at a low concentration in the upper part thereof, and said ground layer covering the surface of said insulating film in said opening part or said depressed part; and

an electroconductive layer embedded in said opening part or said depressed part via said ground layer, said electroconductive layer being formed directly on said upper part of said ground layer.

45. (New Claim) The embedded electroconductive layer according to claim 1, wherein said electroconductive layer is a Cu layer.

46. (New Claim) The embedded electroconductive layer according to claim 3 wherein said electroconductive layer is a Cu layer.

47. (New Claim) The embedded electroconductive layer according to claim 5, wherein said electroconductive layer is a Cu layer.

48. (New Claim) The embedded electroconductive layer according to claim 1, wherein said metal growth promoting layer is a TiN layer including substantially no oxygen except at its surface due to said TiN layer being formed by a chemical vapor deposition (CVD) process.

49. (New Claim) The embedded electroconductive layer according to claim 3, wherein said metal growth promoting layer is a TiN layer including substantially no

oxygen except at its surface due to said TiN layer being formed by a chemical vapor deposition (CVD) process.